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EMERGENCY MANAGEMENT: THE HUMAN FACTOR

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This is another in a series of monographs on the subject of emergency management. The purpose of this series is to share new ideas and information in the field of emergency management. The content does not necessarily represent either the policy or the opinion of the Federal Emergency Management Agency.

ABSTRACT

This monograph summarizes the results of recent emergency management research from a sociological perspective, and presents this information in a format useful and relevant to the local government emergency management community. It begins with a short history of the sociological study of human response to disasters, followed by a discussion of eight topics of concern to emergency managers. Hazard Perception - This topic is impacted by six factors: experience; age; sex; location; job dependency; and personality. There appears to be a minimal correlation between perceived risk and scientifically-assessed risk. Disaster Planning - The organizational location of the disaster planning function varies greatly among the cities and counties. Warning Responses - content, source, and number of warning messages substantially affect the success of the warning effort. Evacuation Processes - Four key axioms dealing with evacuations are discussed, each one is of significance to emergency managers. Emergency Actions - Disaster responses of victims, non-victims, emergency organizations, multi-organizational networks, and the media are examined. Restoration Activities - The same groups listed above are examined in relation to their short- and long-term adaptation to the restoration process. Reconstruction - Attitudes toward reconstruction, behavioral adaptations, and effects of crisis intervention are assessed. Attitudes toward Mitigation - Mitigation is described as a human adjustment to a perceived threat. Three types of "adjustments" are examined: cause modification; reduction of vulnerability; and distribution of actual or anticipated losses. Conclusions drawn from empirical analysis are presented throughout the monograph for use by local emergency management personnel in assessing the degree to which their plans have correctly anticipated the "Human Response".

PREFACE

Disaster plans, like all plans, are based on assumptions. The degree to which those assumptions are correct may determine the success or failure of a plan in the face of a disaster. This monograph examines many assuptions related to emergency management and draws conclusions as to their validity.

Emergency management programs, especially on the local level, exist in an environment where resources are scarce and competition is a reality. Understanding the non-professional's perception of emergency management issues assists the emergency manager in preparing a strategy to compete successfully for these scarce resources.

As evidenced in this monograph, the body of knowledge related to hazard perceptions, human response to disasters, etc., is large, and growing. Emergency managers should avail themselves of this knowledge and be prepared to question their own assumptions that might have been based on a singular experience or gut reaction.

Many emergency managers assume that if they plan for the worst case scenario, they will be ready for whatever comes along. In the face of empirical evidence based on human response, this assumption may not be valid. This monograph suggests that a more successful strategy is to plan for the most likely scenario. Similarly, it is suggested that plans be adjusted to people, rather than adjusting people to plans.

Through continued sociological research into all phases of emergency management in all types of disasters, both natural and man-made, greater insights into the human response to disasters, disaster planning, and emergency management, in general, will emerge. This monograph introduces emergency management personnel to a field of study they may not have been aware of and summarizes the results of specific, exhaustive studies into a level of detail appropriate to the local emergency management environment.

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INTRODUCTION

Emergency management is a complex and multifaced task. Numerous technological innovations have expanded the capacities of emergency managers in exceptional ways. However, the challenges confronting those involved in this enterprise will not be resolved solely through future applications or discoveries of new hardware. Increasingly, the role of the human dimension is being recognized.

During the last decade, the number of social scientists studying aspects of emergency management increased greatly (Drabek, 1984). Indeed, the volume of research attained such a magnitude that the need for improved information retrieval systems was recognized. Initial exploration of computer-based system design alternatives was begun (Rogers and Nehnevajsa, 1984).

The object of this monograph is to identify some highlights. Within the morass of research that has been completed on the human dimension of emergency management, what are the key insights? More specifically, what has been learned that might be useful to local coordinators?

Conclusions have been drawn from a variety of social scientific disciplines, but it should be noted that the focus of this monograph is sociological. Others -- approaching this subject from a different discipline, be it economics or psychology, for example -- may have shifted the emphasis slightly, possibly dramatically.

Following brief comments on the developmental history of social science research in emergency management, substantive conclusions will be summarized regarding eight topics: (1) hazard perceptions; (2) disaster planning; (3) warning responses; (4) evacuation processes; (5) emergency actions; (6) restoration activities; (7) reconstruction; and (8) attitudes toward mitigation.

A selected bibliography includes citations to all studies referenced.

Much has been learned about each of these topics that can enhance the effectiveness of emergency managers. But, translation is required since no two communities or emergencies are identical. Thus, managers must consider the implications of these insights for their local setting, their program, and/or their constituencies. As professionals, it is they who carry the burden of application. And that — like any other form of management -- is an art, at best only informed by science.

STUDYING THE HUMAN FACTOR: A SHORT HISTORY

Prior to the mid-70's, social science research focused on topics that currently define the intellectual substance of emergency management, largely reflected two disciplines -- sociology and social geography. Today, however, scholars from economics, psychology, political science, anthropology, history, public administration, and other disciplines are exploring aspects of the human dimension of emergency management. The questions they ask, the theories that guide them, and the methodologies they employ, differ significantly. The range of human activities that are relevant to problems in emergency management requires the tools and expertise available within these multiple disciplines. In many instances, truly inter-disciplinary teams have emerged because new combinations of theory or method are demanded. Thus, a decade from now, the knowledge base that will be available will differ significantly from that existent today, both in volume and content.

Early on, however, a small number of sociologists -- commonly referred to as disaster researchers -- conducted studies on human response to various forms of emergencies. At times, these studies were opportunistic. That is, disasters of some type occurred in their local communities. Being students of human behavior, they regarded such events as "natural experiments". For example, in 1966, had a tornado not hit Topeka, Kansas, Taylor, Zurcher and Key (1970) probably would never have written a disaster case study. Thus, the literature would have been devoid of a penetrating study of emergent community responses.

In contrast to such instances of opportunity, a tradition of the comparative study of disaster events emerged within sociology. It occurred largely through two continuing research programs. Under the direction of Charles E. Fritz (1961), an ongoing field team based at the National Opinion Research Center of the University of Chicago collected data in numerous disaster-stricken communities during the early 1950's. Insights gained through these studies and observations provided by other sociologists were integrated in a publication series produced by Fritz and others who participated in his follow-on activities at the National Academy of Sciences - National Research Council (see Kreps, 1981 for a review).

The second program is the Disaster Research Center (DRC) that was established at The Ohio State University in 1963. Under the direction of Enrico L. Quarantelli -- and, earlier, one of the Center's co-founders, Russell R. Dynes -- quick response field teams were sponsored, a disaster library was assembled, and hundreds of articles and reports were published.

In January 1985, Quarantelli relocated -- both himself and the DRC -- to the University of Delaware, where Dynes serves as Chairperson of the Sociology Department. There are numerous other sociologists-- ranging from Ralph H. Turner (UCLA) on the West Coast, Peter M. Rossi (University of Massachusetts) in the East, to Fred Bates (University of Georgia) in the South -- who have maintained ongoing disaster research programs. But, Ohio State's DRC has attained a unique identity and has served as both model and linking-pin for scholars in Japan, Australia, Italy, England, and elsewhere.

Turning to social geography, Gilbert F. White is the analog. Through his interest in the range of human adjustments developed in response to flooding,

White (1945) encouraged many to explore natural hazards from a different perspective (1974, 1975). In contrast to the disaster-event focus of the sociologists, White asked: "How do communities seek to use flood-prone lands?" Thus, hazard perceptions, and especially policies related to non-structural mitigation, emerged as their research focus. The best general synthesis of the social geographic research base is a text prepared by Burton, Kates, and White (1978).

A few years after his departure from the University of Chicago in 1970, White established the Natural Hazards Research and Applications Information Center (NHRAIC) at the University of Colorado. This was in response to the need documented in a thorough assessment of the rich potentials for policy-relevant research that existed within the social sciences (White and Haas, 1975). More so than any other setting within the United States, the annual summer workshop sponsored by the NHRAIC has linked researchers from a wide variety of disciplines to practitioners — operations personnel and policy-makers from federal, state, and local agencies, as well as representatives from powerful segments of the private sector, especially insurance and financial institutions. A bimonthly newsletter — The Natural Hazards Observer — now reaches nearly 8,000 subscribers. The 38th monograph was published in 1984.

In direct contrast to these two traditions is a more recent focus on risk assessment and risk management (e.g., Lowrance, 1976, Fischhoff, et al., 1982). While not limited to technological hazards -- be they nuclear power plants or food additives -- various issues pertaining to regulation and public safety have been scrutinized (Petak and Atkisson, 1982). Thus, extending the seminal work of White, others have turned to the role of perception in risk evaluation (Hohenemser, Kates, and Slovic, 1983). Both risk levels and degrees of governmental regulation desired are perceived differently by powerful sets of interest groups (Kunreuther and Ley, 1982). Avenues for public voice and mechanisms for the incorporation of scientific judgment into decision-making processes represent one of the most difficult challenges confronting all industrial societies today.

With this historical overview as a backdrop, let's turn to some conclusions. What is known about the human dimension of emergency management? One final caution is required before we review the answers, however. All conclusions that follow were derived from the wide range of events that have been studied. Today, we still lack a firm fix on response differences across events with varying characteristics — matters like perceived cause, scope, or length of forewarning. Furthermore, the degree to which these conclusions are predictive of human responses that more extreme catastrophes might evoke -- like nuclear war, real or threatened -- remains a matter of conjecture and controversy. The problems of generalization and taxonomy are the most pressing basic science issues in this field today (Kreps, 1984).

HAZARD PERCEPTIONS

While researchers have selected many different natural hazards and locations for study, one conclusion has been consistently found -- there is a persistent tendency to underestimate. Why? About that there is disagreement. Some reseachers emphasize processes of denial, others lament ignorance. Undoubtedly, both are relevant. Disasters, and especially mitigation studies, are quickly put aside and forgotten in the wake of other concerns and priorities associated with contemporary life.

Thus, when compared to other social problems — be they related to unemployment, crime, or even pornography -- neither the public nor local officials put hazards at the top of their priority scales (Rossi, et al., 1982). To some degree, this is understandable. From a statistical sense, tornadoes, hurricanes, earthquakes, and other selected hazards do have a higher probability of happening elsewhere — mainly because there is so much that is elsewhere. As Rossi and his associates (1981) put it, there is a relativity of political aggregation.

> ... the presence of natural disaster problems and the frequency of disastrous events both tend to increase as one moves from smaller to larger aggregates or units. To illustrate, very few families actually experience damage or injury from a natural hazard over the course of any typical decade ... The proportion of local communities that experience such a disaster in the typical decade, of course, would be considerably higher; and the proportion of states, even higher (Rossi, Wright, and Wright, 1981:147).

The implication? Differences in how hazards are perceived relates directly to what people think ought to be done about them.

> Since attention and appropriate policy with respect to natural hazards are very much a function of the seriousness of the problem, it follows that different units of political aggregation will have very different views about what policies to undertake and their urgency (Rossi, Wright and Wright, 1981:148).

Furthermore, it is clear that the reasoning processes and resultant priorities found among the public do not correspond to those of scientists. Upon making such a comparison with 81 different hazards, for example, Hohenemser, Kates, and Slovic (1983) concluded that:

> ... the most striking aspect of these results is that perceived risk shows no significant correlation with factor mortality. Thus, the variable most frequently chosen by scientists to represent risk appears not to be a strong factor in the judgment of our subjects (Hohenemser, Kates and Slovic, 1983:382).

Generally speaking, the public tends to underestimate the risk of death from chronic sources like diabetes or stomach cancer; more publicized things, be they outbreaks of botulism or even tornadoes, are overestimated (Foster, 1980:32), unless, of course, they are matters with which one has become familiar. Thus,

San Franciscans have been found to be highly attached to their city, and downplay the degree of damage that might result from future earthquakes. The longer that persons live in California, the less serious they rate the earthquake risk. The same is true for floodplain dwellers or those residing near volcanoes. A certain degree of risk just comes with the territory (Saarinen, 1982).

As with other attitude sets — be they regarding political candidates or breakfast cereals -- hazard perceptions are affected by highly-publicized events. Thus, there is a dynamic — a relative degree of instability. Events like the accident at Three Mile Island (TMI) or the eruption of Mount St. Helens did skew the perception curves. But, over time, most people drift back toward their earlier position. Nigg's (1982) research on the impact of the California earthquake prediction made by Minturn illustrates this principle.

> The initial high levels of awareness, then, might be viewed as a consequence of unusual circumstances in 1976 -- the widespread media attention to earthquake prediction, major rumors in October and November of a destructive quake, and the widely-publicized Minturn prediction in December. As the impact of these special circumstances wore off, the level of awareness seemed to decline (Nigg, 1982:76).

To put the matter more precisely, six factors have been found to impact hazard awareness:

- Experience
- Age
- Sex
- Location
- Job dependence
- Personality

A. Experience

Experience is probably the most slippery. Depending in part on what was measured, study results do not fit together neatly. Experience seems to be a double-edged sword. That is, several studies have yielded results that coincide with the conclusion reached by Kunreuther and his colleagues (1978:241); "... past experience was the most important factor in alerting homeowners to the seriousness of the hazard".

However, reflecting perhaps the belief that "lightning never strikes the same place twice," some hurricane and earthquake victims evidence attitudes of invulnerability. Thus, while some define the chances of recurrence as better, now having seen a storm's fury, others indicate a belief that the likelihood is slim that such an event will happen again within their lifetime (Jackson, 1981:400-401). Although recency and intensity of damage skew the experience variable toward greater hazard awareness, there are responses of neutralization and denial by some. The consequences of disaster experience are not uniform.

Wenger (1978) untangled this dynamic somewhat in his analysis of "disaster subcultures." Twenty years ago, Moore and his collaborators (1964) introduced

this concept as a partial explanation of a special set of attitude and behavior patterns they had observed throughout the Gulf Coast.

> These defenses include such diverse elements as folk tales of riding debris for days and construction of seawalls. But, at the core is an attitude of defiance and pride in the ability to 'take it' expressed in vehement refusal to flee before the wind (Moore, et al., 1964:195).

Recognizing that such subcultures are not found everywhere, Wenger (1978) identified three qualities of certain disaster agents like hurricanes that appear to promote their development: (1) repetition; (2) moderate forewarning period; and (3) extensive damage.

Thus, for communities and individuals, alike, disaster experiences vary in quality, and so too in consequence.

B. Age and Sex

Age, also, reflects some of this variability. The older one is, the greater the level of hazard awareness. But, so too the level of skepticism. Similarly, males evidence higher levels of hazard awareness, but lower fear levels. Research on Mount St. Helens provides an example study and underscores the implication for emergency managers.

> Throughout the analysis of risk, wives have been more bothered by the mountain than have their husbands. Again, if husbands and wives participated equally in a decision about moving, the wives would more often opt for leaving and the husbands would opt for staying (Leik, Leik, Ekker, and Gifford, 1982:76).

C. Location

Location -- or distance from the river, volcano, power plant, and the like -- affects hazard perceptions too. Again, Mount St. Helens provides a good illustration.

> ... the two closer sites showed higher proportions of people who claimed prior knowledge of potential volcanic danger. Approximately 70% of the residents of the Lewis River communities reported awareness of potentially active volcanoes. A slightly lower proportion (63%) of the Longview sample answered this question in the affirmative (Greene, Perry,and Lindell, 1981:52).

D. Job Dependency

Job dependency -- a quality related to location -- reveals a different dynamic. For years, researchers have documented urban-rural differences. Farmers do have a greater awareness of land-weather relationships. Miners reveal higher tolerance levels of the risks they confront underground. Loggers surveyed

around Mount St. Helens evidenced lower levels of concern regarding future eruptions. In short, when jobs put people in closer proximity to environmental hazards, their knowledge level increases as does the level of risk they regard as acceptable.

E. Personality

Finally, some evidence -- albeit limited and not totally consistent -- indicates that persons with "internally oriented" personalities and holding less fatalist world views have higher levels of hazard awareness and more accurate hazard perceptions (see Simpson-Housley and Bradshaw, 1978:70,71). That is, people who believe that their life is what they make it, rather than being largely a consequence of luck or God's will, not only tend to have more accurate perceptions about risk levels, but also are more apt to have engaged in various forms of protective action. Yet, it is clear that many Americans blend scientific explanations of hazard occurrence with elements of magical or moralistic frameworks. For example, Turner and his associates (1979:144) discovered that 21% of their Los Angeles sample believed that psychics or mystics could predict earthquakes; whereas 3% thought religious leaders could.

In short, perceptions about hazards are patterned and influential. Emergency managers must recognize these invisible webs of constraint and become more actively involved in their modification. Beyond being more sensitive to these elements in perceptual patterning, emergency managers should expand their knowledge base of actual hazard experience. While all may know the historical record of their own locale and its prime sources of vulnerability, few are able to put them into context. While crude estimates regarding annual disaster losses for the nation are available, these have limited utility.

Recently, however, a new form of information was compiled that should be used extensively. Paralleling the logic and methodology of crime victimization surveys -- through which the under-reporting inherent in the Uniform Crime Report Statistics was documented -- Rossi and his colleagues (1983) have built the first national disaster profile. A carefully-selected national sample (n = 13,005) was asked if they had experienced any of five types of disasters between the years of 1970 and 1980.

The percentages indicating this form of victimization were: tornadoes or severe windstorms (11.1%), earthquakes or tremors (7.5%), hurricanes or severe tropical storms (5.1%), household fires (4.3%), floods (2.5%); the five hazards combined (25.3%) (Rossi, et al., 1983:51).

Limiting victimization to instances wherein death, and/or injury, and/or damage to property occurred, the percentages were cut by about one-half: tornadoes or severe windstorms (6.5%), earthquakes or tremors (1.1%), hurricanes or severe tropical storms (2.5%), household fires (3.8%), floods (1.9%); the five hazards combined (14.3%). (Rossi, et al., 1983:55)

Projecting these rates to the total population, the research team concluded that over 4 million (4,093,000) American households are victimized annually by one of these five hazards; or nearly two million (1,959,000) if only the more severe instances are considered.

These rates can be placed into context by comparing them to other forms of victimization. Among the numerous figures reported by Rossi and his team (1983:66) are the following "bad luck" events: automobile accident (8.2%); victim of crime (14.5%); unemployment (13.0%). Various forms of "personal breakdown" were much lower: marital breakup (8.7%); child in trouble (4.0%); mental depression (3.8%); personal bankruptcy (1.4%).

In short, Americans had a much greater chance of being disaster victims (25.3%) during this ten-year period than they did of being victims of crime (14.5%), involved in car wrecks (8.2%), or being without a job (13.0%). Yet, their hazard perceptions and attitudes regarding public policies through which risk might be mitigated are not consistent with this profile. Other social problems -- not natural or technological hazards -- capture the local political agenda and their personal priorities. The challenge for emergency managers is clear.

DISASTER PLANNING

In 1983, returns from a national survey of city and county governments documented the non-standardized quality of emergency management within the United States (Hoetmer, 1983a, 1983b). Most local governments who responded (25.3% return rate from 6,238 jurisdictions) had a disaster plan -- or so they claimed (83% of the cities; 93% of the counties). Reflecting the decentralized quality of emergency management, however, the structural location of the function varied considerably.

> In cities, the city manager (reported by 22.5%), part-time emergency preparedness coordinator (18.8%), or the fire chief (16.2%) was most likely to have this responsibility. On the other hand, in counties, full-time emergency preparedness coordinators (44.3%) or part-time emergency preparedness coordinators (33.3%) were found to have the responsibility for emergency management (Hoetmer, 1983b:1-2).

Thus, paralleling the variety found among public school systems, emergency management within the United States is pluralistic in form and not standardized. While very significant contributions are made by state governments, several Federal agencies and elements of the private sector, the primary capability -- and responsibility -- of the overall national system resides within local governments. Planning modalities and recommendations for change must recognize this structural reality.

Despite the fact that other community issues command higher priorities -- as summarized above -- a survey in California demonstrated clearly that disaster planning is defined by the public as a legitimate function of these governments (Turner, et al., 1979:80). Since it is "government's job", perhaps that is why so many do not assume greater responsibility for disaster preparations -- as, for example, individuals or families. It is clear, however, that this varies. Those living in communities that experience disasters more frequently are more apt to have engaged in some form of preparation (Nigg, 1982:89).

Additionally, when warnings are issued -- be it because of winter blizzards or hurricanes -- many spring into action. For example, prior to the May 1980 eruption of Mount St. Helens, the Cowlitz County Sheriff's Office distributed a pamphlet that urged residents to develop a family emergency plan. Perry and Greene (1983:47) discovered that 81% of the families they interviewed in the Toutle/Silver Lake areas had at least a general plan. Other researchers have discovered that such actions are most frequently undertaken by people who have larger families, higher levels of education; and/or other indicants of socio-economic status (Neal, Perry, and Hawkins, 1982:67). Thus, as among local governments, families evidence much variability. However, the curve is skewed toward the "no-preparation" end of the continuum, unless special pleas have been made regarding anticipated events that are thought to have high probabilities of arriving soon.

An equally critical constraint that emergency managers must recognize is a widespread belief in disaster myths. Survey results clearly indicate that "... individuals expect looting to occur, panic flight to exist, and disaster shock to be present." (Wenger, et al., 1975:45). To a large degree, mythology defines the perceptual reality. The good news comes from the documented results of a study on flooding in four Washington State communities. "Many evacuees, nearly half in three of the sites [studied] expressed concern about looters, but relatively few people said they did not evacuate because of this concern" (Perry, Greene, and Lindell, 1980:446). Thus, despite beliefs that have been proven false, people will respond to official directives if they are properly issued -- this topic is addressed in the next two sub-sections.

Several research studies have reinforced a fundamental axiom: everyday measures used for ordinary emergencies cannot be extrapolated for use in major disasters. Why? Dynes, Quaranelli, and Kreps (1972:48-49) highlighted six qualities that differentiate the disaster environment from the demand structure of everyday emergencies: (1) uncertainty; (2) urgency; (3) development of an emergency concensus: (4) expansion of the citizenship role; (5) convergence; and (6) de-emphasis of contractual and impersonal relationships.

A second axiom states: Realistic disaster planning requires that plans be adjusted to people and not that people be forced to adjust to plans (Quarantelli, 1981:2-3). The implications of this theme are pronounced; yet, too often, are not well understood. Dynes' (1983) disaster planning principles illustrate many of the specifics:

- Planning is a process, rather than a product.
- Planning attempts to reduce the unknown in a problematic situation.
- Planning aims at evoking appropriate actions.
- Planning should be based on what is likely to happen, not on the worst scenario.
- Planning must be based on knowledge.

- Planning should be based on what people will do in an emergency, rather than on trying to get people to behave according to plan.

- Planning should focus on principles, not details.

- Planning is partly an educational activity.

- Planning for emergencies should be based on the patterns of everyday routines.

- Planning should be predicated on sharing information widely to those involved, rather than by restricting information based on the fear it might be misused (adapted from Dynes, 1983:655-656).

These planning principles contrast sharply to those comprising classical theories of management. Such bureaucratic or scientific management theories work well in highly centralized organizations, be they private firms or military agencies. But they do not mesh well with the political or social structure of the emergency management system that exists in the United States (Drabek, 1983b).

Elaborating on this theme, Dynes argued forcefully that an "emergent human resources model" provides a better planning tool for local coordinators than notions of "command and control" or pushes for greater centralization of authority. Hence, he suggested seven guidelines:

- Utilize existing habit patterns as the basis for emergency action;

- Utilize existing social units, rather than create ad hoc ones;

- If outside resources are needed, they should be consistent with local socio-cultural practices;

- Utilize the existing authority structure, rather than create new ones;

- Utilize existing channels of communication and increase them, rather than restrict and narrow them to "official messages";

- The aim of any emergency planning is to move back to "normal" as quickly as possible; and,

- The recovery stage should not be seen as the opportunity for massive (and directed) social change (adapted from Dynes, 1983:659).

Application of these planning principles can carry local coordinators forward. But, what criteria might be used for self-assessment? How can a local manager tell when the job is getting done? Obviously, the best test comes when disaster strikes. However, when disaster strikes, it is often too late for

remedial action. Based on extensive research on evacuation and other planning tasks, Perry (1984:20) listed six criteria for identifying key elements associated with the process of responding to emergencies:

- The problem of notification;
- Damage assessment;
- Public information;
- Protective strategy;
- Responsibility for planning and operations; and
- Personnel training.

Of course, these are minimal requirements, not an exhaustive specification. However, serious self-evaluation on each of these criteria could aid many local directors in establishing subsequent program priorities.

Perry's listing has parallels in conclusions reached earlier by Anderson (1969) and in the policy recommendations spawned by the International City Management Association (ICMA) survey. Local governments were urged to accept four key tasks:

- Have a regular comprehensive preparedness program. Keep it updated and know it.
- Appoint a coordinator who will develop an active program with clearly defined duties and responsibilities.
- Establish an Emergency Operations Center with full communication capabilities.
- Place a high priority on public education (adapted from Hoetmer, 1983a:11).

Beyond these types of general conclusions and recommendations, the research literature underscored a series of critical distinctions. For example, during natural disaster responses, role conflict is experienced by some personnel in emergency organizations. Concern for family well-being may clash with job demands. However, such conflicts do not precipitate job abandonment following tornadoes, hurricanes or other such calamities. Rather, the tendency is to remain on the job -- often for too long. Upon learning that family members may be at risk or in an impacted area, personnel in emergency organizations will investigate the situation, but will not flee from their posts (Quarantelli, 1982b:10).

On the negative side, field data have revealed many points of weakness. For example, upon reviewing hospital readiness for chemical emergencies, Cray (1981) concluded:

> ... most hospital disaster plans do not discuss the special problems associated with the treatment of chemical exposure victims. Moreover, health sector personnel are not aware of a clearinghouse of the equivalent of a poison-control center to contact for information and assistance (Gray, 1981:364).

DISASTER WARNING RESPONSES

Despite the successes of the National Flood Insurance Program (NFIP) and other disaster mitigation efforts, it appears that the populations at risk from hurricanes and floods are increasing. Of course, as many recent hurricanes have demonstrated, so too has the disaster warning capability of the Nation. Because of their episodic quality, as well as other factors, flash floods present a more difficult problem.

Many insights regarding human responses to disaster warnings have been integrated successfully into operational policies of the National Weather Service, the National Hurricane Center, and other such agencies. Probably more than any other facet of the human factor in emergency management, responses to disaster warnings have been dissected carefully.

However -- these responses can be understood only as social processes. Rarely do individuals receive them in total isolation. Why? Simply because most of the day we are participants in primary groups -- at work, home, or play. Furthermore, when time permits, others become involved. Relatives, friends, and neighbors play critical roles during most disaster warning situations. Thus, household composition and linkage patterns to kin and friends greatly affect the way people respond to disaster warnings (Carter, Kendall and Clark, 1983).

But let's digress. What happens when people initially receive a disaster warning message? Typically, the immediate response is one of disbelief rather than panic. In an insightful analysis of this process, Janis and Mann (1977) suggest that people are in a state of "unconflicted inertia". A warning message may or may not move them out of this state -- such actions depend upon the context within which the message occurs, its source, and its specific content. Thus, if word of an approaching tornado is aired during the spring to residents of tornado alley, believability is high, simply because of the social context. Conversely, people who have lived near a quiet mountain stream, one that never has flooded during their lifetime, constitute a social context that acts to neutralize. Regardless of the message content, their initial responses are marked with disbelief. Subsequent threat information often produces emergent definitions of invulnerability.

If they do anything at all, most people seek confirmation. Repeatedly, studies have yielded results paralleling those reported by Perry and Greene (1983) following the eruption of Mount St. Helens.

> ... warning recipients tend to be skeptical of the first warning they hear, and attempt to confirm through some additional source the information given in the warning. More than 80 percent of the samples in both Toutle/Silverlake and Woodland tried to confirm the first warning heard with at least one additional source (Perry and Greene, 1983:66).

How do people confirm? Some contact local authorities. Indeed, when asked if they would be willing to use a warning and evacuation information telephone number, 90% of the residents surveyed in four Washington State communities indicated that they would (Perry, Greene and Lindell, 1980:442). But how many communities have such services? And, what proportions of the population know of them? Presently, we lack answers to both questions.

However, we know from a few cases that warning situations produce "flooded" telephones for local emergency agencies. But these "electronic floods" were found in one study to have come from only ten percent of the community, many of whom received nothing more than a busy signal (Drabek, 1969:343). Thus, it is through appeals to peers -- especially relatives and friends -- that people receive additional information.

Of course, they also turn on a radio or television set and often flip from channel to channel. But often, their slow-growing sense of danger is neutralized by the continuation of routine programming. Vaguely worded news bulletins, and "crawlers" across the bottom of their television screen are subject to "creative re-interpretation" so as to reinforce definitions of personal invulnerability.

In short, three qualities about warning messages have been found to make a difference: (1) content; (2) source; and, (3) number (Perry, Lindell and Greene, 1981).

That is, warning messages will evoke protective activity, to the degree that they are specific and are perceived to be from official sources. Belief increases as the number of warnings received increases, unless there are contradictions. Unfortunately, inconsistencies among warning messages tend to reduce the propensity to act since the least threatening from among the options provided will be seized by most people (Foster, 1980:192).

Of course, not all people respond identically. For example, women, rather than men, are more likely to accept disaster warning messages as valid. Results from several surveys have indicated this. Since many of the men who responded to disaster warning messages, however, were in the presence of family members, this statistical differential may be misleading. That is, most men surveyed had others present who were accepting the messages as valid. Therefore, they could endorse a group decision to evacuate, without admission of fear, and thereby protect their egos.

Similarly, the elderly are more likely to delay leaving the disaster area when danger threatens. Some researchers have interpreted this pattern as proof

that they, too, are less likely to have believed the disaster warning messages. Limited evidence does support such an interpretation (Mileti, 1975:22). However, it has also been found that elderly persons are less likely to receive the warnings in the first place. The degree to which this accounts for the behavior pattern, as opposed to the resistance to believe, remains unclear. Those failing to leave, or at times choosing to delay, are more frequently injured or killed. Regardless of the process involved, the bottom line remains unchanged.

Ethnic minorities also evidence delay and disbelief. Although the dynamics are far from being understood, Perry, Greene and Mushkatel (1983) concluded that the level of perceived risk was correlated with the degree to which the warning source was defined as credible. Others had stressed this factor previously -- it related back to the point regarding message source. But their data added an important link, heretofore not available.

> In connection with the flood threat, most Whites reported having highest confidence in the mass media, with police and fire department officers a distant second choice and personal judgement third. Most Blacks identified police and fire fighters as their source of highest confidence, with neighbors or friends and personal judgement as (again distant) second and third choices, respectively. Mexican-Americans cited neighbors or friends, relatives, and mass media as their sources of highest confidence in descending order (Perry, Greene and Mushkatel, 1983:283).

What are the implications for local emergency managers? There are many. If warned properly, people can and will take protective action. This means that they must receive both threat information and directions for adaptive actions. This also means, however, that a system must exist that can rapidly accomplish seven functions:

- Detection;
- Measurement;
- Collation;
- Interpretation;
- Decision to warn;
- Message content; and,
- Dissemination.

Failure of any one of the aforementioned system components brings delay and confusion at best; and, citizen deaths, at worst.

EVACUATION PROCESSES

After being warned -- and having found a way to confirm the warning -- large proportions of families have evacuated their homes in an orderly and safe manner. Depending upon the specifics, evacuation rates prior to hurricanes or other natural disasters hover around the 50 percent mark. There are exceptional cases, however, wherein the rates have been much higher. Recent examples are Mount St. Helens and Three Mile Island. While both were unique, in the TMI case, many people reported a belief that they might be at risk. "Thus, the perceived negative consequences associated with failing to undertake a protective action, or doing so too late, were extremely high" (Perry, 1983:46).

> In the volcanic eruption studied here, 11.1% of the citizens at risk failed to evacuate. For natural disasters this is a low proportion of nonevacuees, and has been explained in terms of the uniqueness of the disaster and the high levels of community emergency preparedness in the affected communities. The more commonly seen figure is that for the flood communities where about half of those who received a warning failed to evacuate (Quarantelli and Dynes, 1972). At TMI, where only an evacuation advisory for pregnant women and young children was issued, it is estimated that 144,000 people, 39% of the total population within 15 miles of the reactor, evacuated (Perry, 1983:43).

Many of the insights gained regarding evacuation processes cluster about four key axioms:

- Evacuation occurs through multiple pathways; the departure process differs among families.
- When families leave, they either depart as complete units or seek to account for the whereabouts of missing members.
- Public sheltering requirements vary with qualities of both the community and the event, but typically do not exceed 3-6 percent of the total evacuees.
- The evacuation process can be facilitated if certain types of specific actions are taken by local governments.

Often families evacuate their homes while remaining unsure or unconvinced that they are really in danger. Of course, depending upon the event, the disaster history of the community, the quality of the local warning system, and other such factors, many families make a decision to depart because they believe they are at risk. Frequently, however, departure occurs because of compromise, default, or invitation (Drabek, 1969; 1983b).

As noted above regarding gender differentials in warning responses, some males report that they deferred to wives and children who had expressed fears. Occasionally, all three give in to an elderly relative. Often voiced are such statements as: "We left, just to shut-up my aunt; she called three times within an hour!"

At times, such interactions yield invitations. Thus, many families have indicated that their departure was prompted primarily by "invitations" they received from relatives or friends, and not by the belief that they were in danger. In four Washington State communities threatened with flood waters, Perry, Lindell and Greene (1981:141) discovered that over one-fifth of the families received such invitations. Furthermore, they proposed that this process is intensified when: (1) the disaster is localized; (2) the community has a history of flooding; and, (3) forewarning is lengthened.

Evacuation by default occurs in many different ways. But, essentially, the process is one wherein families engage in some type of behavior that was not intended to precipitate evacuation -- yet has that consequence. Among the more frequent occurrences are instances of families driving somewhere to obtain further information -- like to look at the river. After nearing or reaching this location, which may further confirm messages received earlier, they are not allowed to return home due to police barricades. Hence, their evacuation behavior is by default; that is to say, they really never made a decision to engage in the behavioral act, it just happended. Many life experiences reflect "decision by default".

Repeatedly, investigators have documented that when families evacuate, they do so as units (Quarantelli, 1980). Thus, if they happen to be together when warnings are issued, they respond more quickly. When younger children are unlocatable, there is delay. Of course, some events have special characteristics that produce variations. In the TMI case, for example, many pregnant women were perceived to be at greater risk than their spouses. Thus, there was an important variant in this general pattern. As noted by Ziegler and his associates:

> ... while the majority of evacuees left in complete family units, the proportion of partial families fleeing the disaster was larger than would be expected from the conclusions of natural-hazard research. ... partial families composed one-third of all evacuation units, but in the sample communities beyond fifteen miles from the plant, evacuation units were more likely to be partial families than complete families. Within six miles of the plant, complete families outnumbered partial families by more than three to one (Ziegler, Brunn and Johnson, 1984:4-5).

It is important to remember that many family "units" may include pets. In the 1979 Mississauga evacuation, for example, it was discovered that over one-half of the 40,000 households that evacuated had at least one pet (Whyte, 1980:21). Thus, some 30,000 pets -- in addition to the 260,000 people -- had to be dealt with in some manner. To quote Whyte:

> Dogs were generally taken with the family when they left (88%) but cats present a different problem. Many could not be found when the family were leaving and searches had to be made. Less than half the cats were evacuated (Whyte, 1980:21).

If not taken initially -- fish, snakes and birds are often left behind -- however, the pressures to return for these pets are often intensified.

Public shelter planning must take into account the arrival of "complete family units". Fortunately, however, the proportion of families who take refuge in public shelters is relatively low. Quarantelli (1980:125-126) cites statistics like these: Wilkes-Barre, Pennsylvania (flood) - 3.3%; Xenia, Ohio (tornado) - 1.8%; and Mississauga, Canada (hazardous chemical) - 2%.

Perry, Lindell and Greene (1981) found instances that were higher in their Washington State studies -- rates of 26% and 29% in two communities. Both cases were atypical, however. One case involved evacuation of the entire town; thus, homes of relatives and friends were less likely to be available nearby. In the other case, local officials advised victims that shelters were located strategically, since many could not return home for a week. Location--wise, these shelters were closer to their flooded homes than any other housing. Thus, the length of anticipated departure, the degree to which the area is threatened, the community preparedness level, and the length of the forewarning period are among the factors that alter public shelter requirements.

Among the many evacuation facilitators that have been discovered, several apply to families. For example, if families have designed evacuation plans; they will depart more quickly and require less convincing. Thus officials can stimulate evacuation by urging such planning. But, during the warning phase, people should be encouraged to contact friends and relatives who might be in the threatened area and extend an invitation. They are more apt to accept such invitations than the belief that they are at risk. Also, allaying looting fears and establishing greater consistency among media reports will neutralize tendencies for delay.

Organizationally, and across three dozen study sites, a University of Minnesota team documented weak or non-existent linkage sets among those responsible for disaster warnings (Leik, et. al., 1981). Minimal levels of coordination were both forthcoming and predictable. Yet, this need not be. The message ought to be clear. Local emergency managers must recognize that warning and evacuation plans require cross-agency linkage building activites that transcend charts and lines appearing on paper. This deficiency continues to be documented.

> The fact, as a current DRC study shows, that chemical plants or industries usually have very poor or few ties with local civil defense and other public emergency agencies means that evacuation is frequently delayed and not efficiently organized when a nearby or surrounding community is threatened by a toxic chemical cloud from an in-plant fire or explosion (Quarantelli, 1980:26-27).

The bottom line for local governments remains akin to a "pay now, or pay later" dilemma. Failure to build a community evacuation capacity will have its costs during the emergency phase when larger proportions of the citizenry will confront life-threatening conditions. Failure in warning and evacuation systems stimulates search, rescue and recovery demands. "Pay now, or pay later!"

EMERGENCY ENVIRONMENT

Understanding the emergency environment requires insight into the response of at least five different systems: (1) victims; (2) non-victims; (3) emergency organizations; (4) multi-organizational networks; and, (5) the media. Each is a complex response system comprised of sub-units from which important variations in adaptation may occur.

Typically, victims respond to disaster with a remarkable degree of self-control. Rapid adaptations are made to reduce further injury and increase the probability of survival -- both for self and those nearby. There is a restructuring requirement; but most people accomplish this within seconds. Although a small percentage, and this only when the most extreme forms of threat have been experienced or observed, will require a longer period of time to regroup emotionally, most people overcome the shock of impact quite rapidly.

In their responses, victims turn to the familiar. If in their automobiles when a tornado approaches, they tend to remain despite the fact that this may increase their risk of injury or death. For example, in Wichita Falls, Texas (1979), many tried to escape by driving away. The results paralleled flash flood responses in the Big Thompson Canyon (Gruntfest, 1977). Twenty-six (60%) of the 43 traumatic deaths and 30 (51%) of the 59 serious injuries occurred to people who, despite ample warning, went to their cars to drive out of the storm's path (Glass, et al., 1980).

Similarly, if they are in a burning building, there is a tendency to use familiar exits and assume familiar roles. Several recent studies support this important fact. As noted by Bryan (1983):

> ... the stereotyped accounts of individuals panicking and competing for escape from the fire incidents buildings, did not occur within these primarily residential and health care occupancy study populations. Examples of altruistic behavior, involving the notification of others of the incident, evacuation assistance to others, and re-entry into the fire incident structure to assist others were documented (Bryan, 1983:199).

But what about panic? Consistently, victim actions are reported in the media as panic. At times, local officials are quoted as the supporting source, e.g., "people just panicked". What they may have meant by such statements remains ambiguous, of course. Most researchers, however, have followed Quarantelli's lead and have restricted the term to "flight". That is, panic behavior refers to people running from an assumed threat, not just a heightened sense of anxiety.

Recent research on panic behavior provides three key points. First, media accounts of so-called panic episodes continue to reinforce this mythology, but it fails to be confirmed by researchers, here and elsewhere.

> In 1974 there was a radio broadcast in Sweden which made reference to a nuclear plant accident which generated a radioactive cloud drift. As in the instance of the 'Invasion of Mars' broadcast, this too was purely a fictional account. News

> accounts described fleeing and hysterical persons. ... A team of Swedish sociologists decided to make an intensive study of the reactions of the population in the affected area. (23. Rosengren, K. The Barseback Panic. Lund, Sweden, University of Lund, 1974.) They undertook an intensive interview sample of the population in the affected area, examined records, and police reports and thoroughly looked into all the behavioral reactions. They found not one single case of flight in their sample (Quarantelli, 1977:7).

Second, there are instances of "stampede behavior". These are similar to, but not the same as, panic flight. Hargreaves (1980) provides a good example of such behavior at a rock music concert:

> ... a large number of young people were congregated outside a small door opening to an auditorium where a concert had begun in Cincinnati, Ohio. In the rush to get into the concert hall, many young people apparently died of suffocation and many were trampled by the crowd (Hargreaves, 1980:683).

After reviewing a large number of such cases, Quarantelli (1977) proposed that the following conditions -- defining a situation that rarely has been found to exist -- probably are required to produce true episodes of panic flight.

1. The existence of a pre-crisis definition of certain kinds of crisis settings as having high potential for evoking panic or flight.

2. The absense of pre-crisis social ties among the potential participants.

3. A perception of possible entrapment.

4. A sense of powerlessness or impotency in the situation.

5. A feeling of social isolation or sole dependency upon oneself in the crisis (adapted from Quarantelli, 1977:7).

Like victims, many non-victims require a brief period of time for interpretation and restructuring. Depending upon the assumptions they make regarding relatives or friends who may be in the impact area -- pull factors -- and jobs or other responsibilites that act as holding factors, many non-victims will converge on the disaster scene. This behavior pattern reflects varied motivations of differing intensities, not the least of which is curiousity. But, once at the scene, many who are drawn there simply because of curiousity become caught up in the acts of helping. Altruism, not antisocial behaviors such as looting, is the hallmark characertistic. Interestingly, interview data repeatedly indicated that most participants -- be they victims, non-victims, or local government officials -- attribute such responses to the unique qualities of their communities.

The scope of this mass assault, as Barton (1969) labeled it, has been delineated somewhat. For example, following the 1979 tornado in Wichita Falls,

Texas (population 94,201), we projected that upwards of 10,000 individuals may have been involved in search and rescue activities within minutes (Drabek, et al., 1981:97).

Here and elsewhere, we documented a major consequence. That is, only small proportions of the disaster victims were transported to hospitals by emergency personnel. Thus, hospital plans will fail if they do not reflect this behavioral response and its many consequences. For example, most people transporting victims from a disaster scene will be unfamiliar with emergency procedures and entrances.

When a disaster occurs many non-victims will volunteer their services -- especially to fulfill a need that is not being met (or is perceived as not being met). In some instances, volunteers will remain in the disaster area for an extended period of time, organizing informal groups and performing such activities as search and rescue, temporary repairs, or security operations.

Also, such emergent actions are found within local government organizations. Indeed, the scope of emergence among responding organizations is pervasive.

A typology developed at the Ohio State University Disaster Research Center has been an important aid in sorting out these response qualities. By cross- tabulating two dimensions -- tasks and structure -- a four-fold organizational typology was produced. Tasks may be regular or nonregular. Also, structure can be thought of as old or new. In short, this typology directs us to ask: "Prior to the event, were the tasks performed and the structures used operational?" Thus, four types of organized reponses are derived.

- Established (regular, old);
- Expanding (regular, new);
- Extending (nonregular, old); and,
- Emergent (nonregular, new). (Dynes, 1970).

As the demands of a disaster escalate, local organizations seek to adapt. Many take on new tasks precipitated by the event and, thus, behave as do other "extending" organizations. Others improvise new structural elements, often by absorbing for a short time citizen groups that have emerged; in this sense, they are "expanding" organizations.

These processes, and others, culminate intense pressures to decentralize the previous pattern of decision-making. "The rate of decision-making increases as does the number of decisions and, particularly, at lower levels of the organization" (Dynes and Quarantelli, 1977:24). Often, there just isn't time to consult or seek approval through customary channels.

As hours zip by, personnel at all levels remain unaware of their growing fatigue. Since needs remain unmet, too often they extend their crisis response much too long, unable to recognize that the quality of their

performance has begun to deteriorate. This process has been noted widely by researchers, but, to date, the dynamics have not been adequately pinned down.

> The principle psychiatric symptom mentioned in the record of the Big Thompson Flood of 1976 was burn-out among a few pivotal law officers. (p. 326) ... the burn-out symptom, a state of exhaustion, irritability, and fatigue which may creep up on an individual unrecognized and undetected, and markedly decrease his effectiveness and capability. ... Symptoms include confusion; slowness of thought; inability to make decisions, to think of alternatives or to assign priorities; negative feelings about self and others; cynical dehumanizing attitudes; depression, irritability, over-excitability, extreme mood swings; physical and sleep disturbance (Hartmann and Allison, 1981:324, 326).

Interorganizational relationships are altered even more dramatically, both horizontally and vertically. Recent social mappings of cross-agency communication and decision-making structures following six large-scale disasters have confirmed earlier conclusions and extended our understanding of additional issues (Drabek, 1983b). In contrast to the pressures for decentralization within the responding organization, the interorganizational matrix is simultaneously pushed toward greater centralization. Participating managers, however, sense this transformation more in terms of operational problems, rather than grasping the more fundamental process. That is, the structure of the organizational task or demand environment is altered dramatically, and, hence, a new system design is required.

At the problem level, four themes were depicted by the managers interviewed:

- Interagency communications;
- Ambiguity of authority;
- Poor utilization of special resources; and,
- Unplanned media relationships, (Drabek, et al., 1981:240).

In actuality, these matters reflect the need for improved coordination among the responding organizations. Expanded communication capabilities can be an important step, but, alone do not guarantee improved coordination. Indeed, if done by each agency separately, additional communication hardware may further exacerbate these problems. Structurally, the single most significant development to improve coordination would be community emergency operations center (EOC) that could link the horizontal sector of the network with vertical elements from state and federal agencies. Our research documented the functioning of several of these. While the national situation is improving, researchers still document EOCs that are isolated from major segments of the emergent multi-organizational response network (Leik, et al., 1981).

Finally, limited evidence indicates acute tension regarding the interface between managers within emergency response systems and media personnel. One survey of local officials revealed that they were very critical of the media's

coverage of destruction. "Sixty-two percent of them believed that the media tend to exaggerate. ... Even 33.3 percent of the media representatives, ... agree that media reports tend to overstate the devastation" (Wenger, 1980:253).

Researchers examining actual media responses have portrayed a mixed picture. Typical of the findings scattered throughout the literature are these two from Canada. Both highlight a problem that merits further attention -- by both researchers and practitioners.

> We identified 23 specific and verifiable factual errors in the reports we examined. All 23 were in accounts that contained no attribution, no information about the source. The media, apparently, either produced figures out of thin air or did not consider it important to inform their audiences of the source of their data. (p. 71) ... On the whole, however, it tends to confirm most of what scholars have reported. The media were inaccurate, confused and contradictory. And they appear to act as Wright suggested -- as open carriers of information without regard to source (p. 72) (Scanlon, Luukko and Morton, 1978:69, 71, 72).

> Interview data from our Port Alice study supports the idea that media accounts are riddled with rumors; fully 76% of those in the sample reported hearing rumors ... About one of every four who heard a rumor said he heard it first on radio or television. Of those who heard four or more almost all said some came from media. And there was evidence the media did not correct their blunders. Only 5% of those who discovered the falsehoods said they acquired the correct information from the media (Scanlon and Frizzell, 1979:316-317).

THE RESTORATION PERIOD

During the first weeks after a disaster, communities experience several transformations that differ from those evoked during the emergency period. From the vantage point of victims, it is a time when aid assumes a reversed pattern. The wide mouth of the funnel is turned 180 degrees as over time, informal offers of assistance dwindle. Increasingly, the proportion of helpers representing bureaucratic structures rises -- be they voluntary, private, or governmental. Often, those helpers who were spurred into action by the drama of the event retreat back into their daily life routines.

Failing to understand that this process (i.e., the attrition of helping organizations during the restoration period) is normal -- although it has been documented repeatedly -- many victims evidence varied degrees of hostility. Because they are frustrated, are often uncertain about the future; and are now more fully cognizant of the enormity of their losses, some victims will lash out at those who are left to pick up the pieces. The "bitch" phase has begun. Over time, most of these negative feelings will be placed into proper perspective. Those who have remained to help will be remembered more kindly, three or four years afterwards.

Thus, in sharp contrast to the hostilities directed toward the Red Cross personnel that Taylor, Zurcher and Key (1970) captured during this phase following the 1966 tornado in Topeka, our follow-up interviews three years later revealed much mellowing (Drabek and Key, 1984). This same pattern has been documented by others (e.g., James and Wenger, 1978; Bourgue, et al., 1973). Similarly, the national survey completed by Rossi and his associates (1983) confirmed this projection.

> The American National Red Cross apparently earns its high reputation for responsiveness to natural hazard events; in one study, it registered high levels of contact in connection with each type of event. Indeed, one in four of the households experiencing a serious flood event claimed that it was contacted by the Red Cross (Rossi, et al., 1983:160).

Some of this negativism -- feelings that contrast so sharply to the euphoria of the emergency period -- reflects the emergence of various health symptom patterns. For example, following an earthquake in Japan, Takuma (1978: 169, 170) documented that a week later, 50 percent reported headaches, 45 percent suffered from insomnia, and 42 percent indicated irritability. Fortunately, for most of these symptoms, the decay curve is fairly rapid. Thus, six weeks later, the percentages had dropped markedly for each (i.e., headaches (28%); insomnia (22%); and irritability (39%)).

Parallel patterns have been documented following a few disasters within the United States. Thus, following the Three Mile Island accident, only a small percentage of the population reported symptom patterns six months after the incident (Flynn and Chalmers, 1980:65-66). Various behavioral adjustments also follow this curve. For example, there was an increase in the purchase of alcohol -- about the equivalent of that taking place prior to the Christmas season -- but it tapered off quickly (Mileti, et al., 1983).

> Adult respondents were also asked about changes in their use of alcohol, tobacco, sleeping pills, and tranquilizers. While such changes are not direct responses to the crisis, they can be seen as efforts to deal with the anxiety associated with an uncertain situation. Generally, increases were seen in the use of all four substances, though only for the period of the crisis; use of all four substances quickly returned to baseline levels (Bartlett, Houts, Byrnes, and Miller, 1983:30).

Of course, not all victims respond identically. For example, elderly victims have been found to report rather different priorities regarding their losses. Trees, rose gardens, and household objects of sentimental value are missed more than the types of items that younger people describe (Kilijanek and Drabek, 1979). Yet, a number of studies have concluded that elderly disaster victims more quickly put the experience into perspective (Bolin, 1982; Bolin, 1984).

> To the question 'Many people feel that they will never recover from the effects of the flood. Do you feel this way?', 42% of

> those under 65 said 'yes' while only 29% of the older respondents felt that way ... Resilience and fortitude is much more apparent among the elderly with the younger residents expressing more despair (Huerta and Horton, 1978:543).

Turning the coin, the literature contains occasional reference to positive outcomes. In part, this reflects the bias of most investigators -- a matter that may change in the future. To date, however, most have approached the disaster scene with an eye for victim pathologies. Because of this, there may be types of positive consequences that have eluded researchers. For example, interviews with nursing students a few weeks after the Wichita Falls, Texas, tornado, revealed that:

> ... the disaster reinforced their desire to pursue their nursing education. The universal comment was that suffering through this natural disaster deepened their commitment to nursing (Palmer, 1980:682).

In direct contrast to matters like this, other researchers have stressed the importance of dealing with emotions that commonly are labeled "survivor guilt". When large numbers of death and injuries occur, this may be exacerbated. Many psychologically-oriented researchers make the assumption that all who survive -- maybe only for fleeting instances -- will experience a sense of relief that they were spared.

For example, following a train wreck, Raphael (1977) concluded:

> People with minor injuries, or who travelled on the train and escaped uninjured, may have periods of anxiety. Once the initial period of feeling gratitude for surviving passes, previously mentioned feelings of 'survivor guilt' sometimes come to the surface, or there may be a free-floating sense of anxiety or dread (Raphael, 1977:303, 304, 305).

Parallel concerns were expressed regarding rescue workers.

> Delayed emotional responses are likely and a necessary release for all workers. Many will be able to have an emotional catharsis with their own families or mates, telling of their experience and feeling safe to share the horror of the scene. Particular feelings of helplessness and frustration where rescue was impaired and death occurred despite all efforts, may evoke a great deal of anxiety, anger and horror which may need to be worked through at a later date. Where mutilation and destruction of bodies was immense, as in this disaster, there is a confrontation of one's body (Raphael, 1977:305).

A much better understanding of these matters is needed. Some work is in process and there are reasons to assume that more studies will be completed in the future. For the time being, however, conclusions from two studies provide a balanced perspective regarding what local emergency managers can anticipate and do.

> One-fourth of the victims felt that the tornado had created some interpersonal strain among family members. In contrast, almost three-fourths reported an increase in subjective distress that usually was associated with tension, nervousness and anxiety, and minor somatic complaints. Nevertheless, the vast majority of the victims who reported some psychological distress in themselves or their families expressed the belief that these emotional reactions were natural and would pass in time, especially as financial problems were resolved and as they experienced less destructive storms. Clearly, the victims did not associate the post-tornado emotional reactions with a need for assistance from a mental health professional. Much of the emotional distress experienced by victims resembled that commonly seen in otherwise healthy individuals who experience some type of personal crisis (Penick, Powell and Sieck, 1976:67, 68).
>
> It is not an exaggeration to say that the notion of mental health counseling carries a certain stigma with it for many of the citizens of north central Texas. Part of the problem in getting victims in need of crisis counseling to utilize services available through the Mental Health Center in Wichita Falls was making them understand that, within broad parameters, stress reactions to the storms were normal and nothing to be ashamed of. Some reluctance to utilize crisis counseling was also an outgrowth of sloganeering that emerged in the aftermath. The phrase 'Wichita Falls is Coming Back Strong and Fast' found its way onto innumerable bumper stickers and posters. As several crisis counselors told interviewers, some of the clients admitted hesitation in using counseling services because they saw it as a sign of weakness on their part, i.e., <u>they</u> weren't coming back strong and fast (Bolin, 1982:178-79).

Organizationally, local managers confront massive clean-up tasks following most disasters. Those who have been through it before have been found to fare better the next time around. In part, this is because they learned how to identify, secure, and coordinate assistance received from sources external to their communities. First timers did so too <u>if</u> -- and only if -- they had cultivated and maintained wide contacts with external agencies (Rubin, 1981:9).

As with victims during this period, organizational managers confront the gradual resumption of pre-event hostilities, cleavages, and conflicts. At times, these are exacerbated, especially if the event, or aspects of it, can be pinned on someone. Flooding in Austin, Texas, during 1981 represents a typical case.

> Austin civic life has been enlivened for some years by skirmishes and battles between those who wish to encourage population and economic growth and those who see such growth as threatening the urban and suburban amenities they hold dear. Consequently, it was not surprising that voices were heard, soon after the waters subsided, charging that unbridled 'development' was the major cause ... (Committee on Natural Disasters, 1982:28).

These conflict processes contrast sharply to the emergency period with its qualities of altruism, outpourings of helping behaviors, and intensification of organizational cooperation and commitment.

Elaborating on this theme, Quarantelli and Dynes identified seven factors that account for the reduction of conflict, especially during the emergency period:

- Natural disasters involve an external threat;
- The disaster agent can generally be perceived and specified;
- There is high consensus on priorities;
- Disasters create community-wide problems that need to be quickly solved;
- Disasters cause a focusing of attention on the present;
- There is a leveling of social distinctions; and,
- Disasters strengthen community identification (Adapted from Quarantelli and Dynes, 1976:141-143).

Conversely, three factors amplify conflict:

- In-group -- out-group political lines, e.g., local community officials may be from one political party, but state and national officials represent another;
- An ideological component, e.g., charges that relief and rehabilitation administration has discriminated against various disadvantaged groups, such as blacks;
- Vested interests, e.g., competition between the newly-emergent and the more established organizations in the community (adapted from Quarantelli and Dynes, 1976:148-149).

Foremost on the minds of victims during these ensuing weeks is one question: "When can we return home?" Many will endure extreme hardship so as to move back quickly. Of course, the attachment to place is weaker among renters. As noted by Quarantelli (1982):

> ... the vast majority relocate back to their old location, often rebuilding on the same spot they occupied in preimpact times. However, this seems more true of homeowners then renters. Renters not only take longer to obtain permanent housing, but sometimes they never return to the same location. In addition, in the communities studied, there was actual resistance to the development of multi-family housing designed as rental property (Quarantelli, 1982a:78).

For those who must wait, temporary housing can be problematic for many reasons, as both Quarantelli, Bolin and others have noted:

> ... displaced persons much prefer to locate a mobile home on their own property rather than in a trailer camp. Such camps are often objected to by the residents of the neighborhoods in which they are located. ... trailer camps show little collective unity or morale, and not infrequently become the source of certain kinds of social pathologies, especially when children and adolescents are part of the camp population (Quarantelli, 1982a:77).
>
> As the reconstruction process continues, community level decisions can affect the hierarchy of return. ... One need only look at the Wichita Falls city council's indecision on the placement of mobile homes. Victims didn't know from week to week whether the trailers they had placed on their house lots were legal or illegal, or for that matter whether FEMA might confiscate them. That such uncertainty in the early stages of recovery was stressful was readily apparent from interviews with victims. The city council, however, had to consider both the early return to normalcy and the longer-term consequences of their decisions. In their rush to take decisive action to help victims by permitting mobile homes on private lots, they acted so quickly that they then reversed themselves repeatedly until they returned to their original decision (Bolin, 1982:62).

ISSUES IN RECONSTRUCTION

Typically, communities rebound from the ravages of disaster so as to blot out nearly all impacts -- physical, economic and social. While new construction may result in many being less vulnerable for the next earthquake, hurricane, tornado, or other disaster, studies have found minimal traces of impact when community-based indicators are used as yardsticks and time is scaled in decades (Friesema, et al., 1979; Wright, et al., 1979).

This is not to say that reconstruction is free of problems or that these events leave no scars. Both are there, but each must be kept in perspective. The primary developmental pattern, regardless of the type of system examined, is continuity with the past. Some pre-existing trends have been found to have been accelerated somewhat (Anderson, 1970). Thus, most changes are reflective of a slight push forward -- in whatever direction the systems were headed before disaster struck.

In more stratified societies -- for example, Guatamala and Italy -- disasters appear to have widened the gap between the rich and poor (Bates, 1982; Geipel, 1982). The wealthy have greater recovery capacity and can more easily isolate their holdings -- the poor just suffer, maybe requiring years to get back to their earlier standard of living.

Thus, despite elaborate reconstruction plans that often emerge during the restoration period, three to four years later, most pre-event developmental patterns have been found to have been resumed. In many cases, rebuilding

occurs before the planning process is completed. Francaviglia's (1978) assessment of the reconstruction of Xenia, Ohio, following the 1974 tornado, illustrates this principle which is also documented in a work by Haas, Kates and Bowden (1977).

> The Miami Valley Regional Planning Commission report (Xenia Rebuilds) offered three alternative land use design proposals, one of which was strongly recommended. That plan included three major elements which would theoretically correct mistakes and thus enhance the design, desirability, and image of the community (p. 17) ... Enough time has passed in the rebuilding of Xenia to allow the judgement that the tornado simply accelerated the major pre-disaster discard and assimilation forces and thereby has perpetuated the principle elements of the psychological geography of 'Ohio Town' (Francaviglia, 1978:17, 24).

Given the range of disasters experienced within the United States during the past three decades, the interpretation of this pattern of stability offered by Friesema and his colleagues probably is correct.

> ... the American society and policy has become so knit together and the economy so integrated by the mid-20th century that most of the economic costs of natural disasters are externalized to the larger, carrying society (Friesema, et al., 1979:177-178).

That is, given state and federal disaster recovery programs, insurance mechanisms, and so on, losses suffered by any given community are spread across a very wide economic base, thereby greatly neutralizing certain impacts. Given regional and national interdependencies, plus existent disaster response mechanisms, only rare catastrophic events may disrupt the pattern of continuity.

When we turn to micro-systems like individuals or families, however, the imprint is deepened. For example, when compared to matched samples of non-victim families, and their own responses prior to the 1966 tornado, victims in Topeka, Kansas, evidenced slight changes in family fuctioning (Drabek and Key, 1976; 1984). Internally, there were several indicants of a pulling in, a heightened sense of family cohesion. Even more pronounced were changes in interaction with, and commitment to, kin. The same was true for friends, but the shift was less intense.

In contrast, contacts with neighbors and participation in voluntary associations were dampened. There was a sole exception; commitment to, and participation in, religious organizations was intensified -- just the opposite of the Parent Teachers Association, Lions, or other such associations. While there are some inconsistencies, these overall patterns have been found following other events as well (Bolin, 1982; Leik, et al., 1982).

Statistically controlling on several qualities and relating these shifts to the recovery experience, strong support was generated for Fritz's therapeutic community hypothesis (1961). That is, these Topeka victims recovered quickly through an intensive series of helping relationships -- both formal and informal. And, three years afterwards, there was strong evidence of differential adapation. Linkages most used during cleanup were now strong --

resulting in closer, lasting personal relationsips with relatives, friends and neighbors. The form and application of the relationship-strengthening process varied; however, the determinate seemed to be the type and degree of participation in the post-disaster healing process.

Differing patterns of family adaptation have been discovered among those widowed by disaster (Harvey and Bahr, 1980) and women confronting the terrible ambiguity that began with word that their husbands were "missing in action" (McCubbin, Olson and Patterson, 1983). While the patterns varied, there is no question that these stressors left deep imprints.

Consistently, researchers have documented heightened weather consciousness among tornado victims. Years later, storm clouds produce higher levels of anxiety -- emotions that spur most to take protective action (Drabek and Key, 1984; Bolin, 1982). Thus, as was noted above, the experience of disaster does impact hazard perceptions -- sometimes serving to reinforce fears that may be unfounded.

> The principal finding to be noted with regard to perceived danger of living near a nuclear power facility is that the large majority of residents feel it is dangerous, although the percentage declines over time. When asked about TMI, however, the percentages are even higher, and they are constant over time. Part 3 of Table One indicated that when asked specifically about fear of living near TMI, nearly half of the residents at Time One, Time Two, and Time Three reported that these fears occurred fairly or very often. ... An increasing proportion of the population perceived that their chances of getting cancer have gone up due to the TMI accident, from 39 percent six months after the accident to 58 percent one and one-half years after the accident (Schorr, Goldsteen and Coates, 1982:12-13).

While not well understood presently, some evidence indicates that for special groups -- especially the poor and ethnic minorities -- undesirable disaster impacts persist (Bolin, 1984; 1982). The same is true of children (Ollendick and Hoffman, 1982).

> Separation anxiety refers to fears the children have of being away from home during cloudy/stormy weather. In Wichita Falls both victim and control families with children report separation anxieties at relatively high, but declining rates. Victim rates were apparently 25% higher and showed a smaller decline at Time 2, indicating a relatively persistent phenomenon. In Vernon, rates are similar to those in Wichita Falls but, as with other measures, both victims and controls have increasing rates (Bolin, 1982:120-121).

The adult population presents more of a puzzle. Numerous studies reveal minimal negative impacts of a long-term nature (e.g., Drabek and Key, 1976; Taylor, Ross and Quarantelli, 1976; Bell, 1978). Yet, parallel evidence following TMI clearly documented that some remain scarred (Schorr, Goldsteen and Cortes, 1982).

> ... during this 13 month period, 33% of TMI mothers and 14% of Beaver County mothers reported one or more episodes of anxiety or depression. ... compared to their controls, the rate of clinical episodes of depression and/or anxiety following the TMI accident was more than twice as high among TMI area mothers. When asked about events that might have triggered their disorder, more than half of the TMI mothers spontaneously mentioned the accident; none of the control mothers made this attribution (Bromet and Dunn, 1981:13).

More so than any event studied to date, negative long-term impacts have been documented following the flash flood that pulverized the Appalachian hamlet of Buffalo Creek, West Virginia, in 1972. "Some 615 survivors of the Buffalo Creek flood were examined by psychiatrists one and a half years after the event, and 570 of them, a grim 93 percent, were found to be suffering from an identifiable disturbance" (Erikson, 1976b:58).

Six years later, follow-ups continued to register widespread presence of symptom patterns and various forms of behavioral coping actions like alcohol abuse.

> ... the psychic distress experienced by many of the Buffalo Creek victims was crippling to the extent of interfering with effective daily functioning, ... among those followed as long as four to five years post-disaster, over 30% continued to suffer debilitating symptoms. ... 30% indicated increased alcohol consumption; 44% increased cigarette smoking, and 52% increased use of prescription drugs. As expected, these increases tended to occur in families in which the adults displayed the more severe symptoms, particularly with regard to anxiety and depression, ... Over three-fourths of the respondents admitted to having difficulty in getting to sleep or staying asleep during the week preceeding the interview, more than two years after the disaster. Approximately one-third of the respondents who needed to use medication at least 'sometimes' or 'often' had nightmares. These percentages are very much higher than those found in general population surveys (Gleser, Green and Winget, 1981:141).

The puzzle remains. Why is the Buffalo Creek episode so much at variance with other disasters? While there are many possibilities, this question illustrates the most fundamental weakness in the current knowledge base. Except for the few findings listed throughout this monograph that were based on national surveys, the range of generalization remains unclear for all others.

Buffalo Creek, West Virginia, is not Topeka, Kansas; Xenia, Ohio; or Omaha, Nebraska -- sites wherein few long-term negative impacts were found. Independent of problems with, and differences in, methodology, the community structures differ greatly as did the recovery processes they produced. The three tornado sites were well integrated communities that recovered quickly;

therapeutic communities emerged rapidly to aid those requiring healing. Additionally, from the victim's vantage point, the flash flood that struck Buffalo Creek was a far more horrifying experience and was worsened by a high death toll (Erikson, 1976a).

Event and population differences -- along with serious problems in method -- probably account for the inconsistencies in these findings. Until a better basis for comparison has been constructed by the research community, practitioners must treat these conclusions as insights for guidance, not a calculus for projection. The best that can be said at this point is that following most disasters, nearly all victims will be healed through the natural nurturing processes that occur within their primary groups -- family, friends, and church. If professional help is offered, relatively small percentages will accept. For example, following the Beverly Hill Supper Club fire in Southgate, Kentucky (May, 1977), an intervention team activated an outreach program.

> Specific outreach programs to well-defined populations of survivors resulted in a seven percent positive response rate within special patron groups, and 14% positive response rate for those contacted by direct telephone outreach. Our total formal outreach effort yielded five percent of an estimated potentially available survivor population (Lindy, Grace and Green, 1981:474).

It is likely that those accepting such assistance will experience fewer negative impacts of a lasting nature. In fact, the healing process(es) may be quickened. However, this is a dynamic about which we still need to learn a great deal.

Finally, small segments of the public may become "racialized", especially following technological disasters. For example, surveys following the TMI accident indicated that only five percent of the citizens in four nearby communities were undecided regarding a series of issues related to the future of these plants (Walsh and Warland, 1983:772).

Of those supporting nuclear power, only two percent became involved subsequently in citizen action groups. Of those opposed, 13 percent became activists. Ignoring which side of the fence they selected, rather predictable factors marked those who were most likely to select this type of adaptation. Certain background characteristics, for example, higher levels of education, occupation, and income, were important indicants, as were pre-accident solidarity networks and pre-accident ideology. Reflecting the continuing transformation of American society, especially a rising value on citizen participation in the policy-making process, the emergence of such groups following disasters undoubtedly will increase (Soderstrom, et al., 1984).

Thus, the political impact of disaster may be far reaching at times. One study discovered that "... within three years of the disaster, there was a change from a council manager to strong mayor form" (Wolensky and Miller, 1981:499). Of course, this change may have been in process, but according to the researchers, it "... appeared to be triggered by the disaster, especially

the perceived ineffectiveness of local government response, although no direct cause-effect relation can be made until additional data are gathered" (Wolensky and Miller, 1981:499). Thus, the human factor again emerges as one that emergency managers can ill afford to ignore.

ATTITUDES TOWARD MITIGATION

In contrast to studies of responses following disasters, many researchers have examined human actions intended to mitigate. Broadly speaking, such actions -- or "adjustments" to use the term introduced by White (e.g., 1974) -- reflect one of three types of efforts:

- Modify the cause (e.g., hail suppression);
- Reduce the vulnerability level (e.g., rezoning the floodplain); and,
- Distribute losses, actual or anticipated (e.g., insurance) (White and Haas, 1975).

Thus, there are many approaches and alternatives to hazard mitigation. But, the essential insight is to recognize the interdependency between natural phenomenon and human activities. Floods, like volcanoes or droughts, have occurred for eons. It is the quality of the human adjustment to them that creates this form of disaster.

Upon reviewing actions taken in some communities, many researchers have hit this theme hard.

> In April 1979, the Pearl River in Mississippi inflicted damage estimated at one-half billion dollars in the City of Jackson and surrounding areas. Most property damage accrued to development built in the floodplain since the previous major flood in 1961 (Platt, 1982:219).

Earlier, study across several sites had documented the key managerial constraint -- interagency coordination failures (Platt, et al., 1980). To Platt, the implications for national flood policy were clear. These included the need for:

- Land use regulations as concomitants to flood control structures;
- Improved coordination between different levels and units of government sharing jurisdiction over floodplains;
- Location of vital public service outside floodplains; and,
- Revision of post-disaster recovery policies to encourage mitigation of future losses (adapted from Platt, 1982:219).

But, as with everything else, for all assumed benefits, there are costs. The issue -- as Milliman (1983) has outlined so effectively -- is not "What should be done to eliminate flooding?" Rather, we must ask: "What is the most efficient use of flood-prone lands?" When hazard mitigation is approached from this philosophical orientation, human behavior takes on new meaning. Not all costs are shared equally; hence, patterns of resistance -- especially to certain mitigation schemes -- can be expected.

Fundamental differences in values often are revealed when public controversies regarding hazard mitigation are examined (Soderstron, et al., 1984). For as Perrow (1984:306) noted, regarding risk assessment studies, "Ultimately, the issue is not risk, but power; the power to impose risks on the many for the benefit of the few."

Fears of economic losses may or may not be valid, but as with any other fear, they are real in their consequence. Of course, some resistance can be shown to be rooted in ignorance or false assumptions. Studies of hail suppression experiments, however, demonstrated clearly that the greater the perceived level of dissensus among scientists, the less probability of adoption (Farhar, 1976).

The simple fact is, most people don't consider more than a fraction of the full range of information about hazards or potential adjustments to them. "Even if they were to have such information, they would have trouble processing it ..." (Burton, Kates and White, 1978:52). In short, people reflect at best, a "bounded rationality" in their choices, be the matter hazard mitigation or another.

Within their matrix of choices, however, Americans have a penchant for technological solutions. Historically, "quick-fixes" have come to our rescue more than once. Thus, when asked about solutions, orange growers in Florida described heating devices (Ward, 1974) and floodplain occupants emphasized government built dams and channelization programs. "Few mentioned any type of individual adjustment and only a small percentage (14.5%) intend to purchase flood insurance" (McPherson and Saarinen, 1977:39).

More recent research results are less gloomy, however. Despite our penchant for the technological, national policy was deflected during the 1970s so as to reflect a mix of adjustments to hazards. Undoubtedly, among the boldest of these new approaches was the National Flood Insurance Program. As of mid-1983, nearly two million policy holders had flood insurance in force within more than 17,000 participating communities. Of course, much remained undone, including 7,000 communities that awaited study.

Americans have come to accept many forms of insurance, at least behaviorally. Undoubtedly, requirements from lending institutions have had a major impact on this behavior pattern. Through the national disaster victimization survey, Rossi and his colleagues (1983) discovered that:

> ... strong majorities of households experiencing serious fires (83%), hurricane damage (82%), and tornado damage (81%) expected that their insurance would cover at least some portion of their losses. The corresponding proportions for floods and earthquakes were much lower (45% and 35% respectively) (Rossi, et al., 1983:131).

Attitudinally, however, Americans present a complex picture. Hence, except when required by lending institutions, many will not accept this mitigation. Why? Studies by Kunreuther and his associates (1978) provided the answer. In essence, "... people refuse to attend or worry abvout events whose probability is below some threshold ..." (Kunreuther, et al., 1978:236). According to traditional economic theory, i.e., the so-called expected utility model, people should insure against potential events that have a low probability of occurring, but could produce catastrophic loss. That is why lending institutions came to require house insurance in the first place -- fire was the low probability hazard of prime concern.

But, Kunreuther's team found that the logic used by most people is just the opposite of that characterizing bankers. Their respondents were more concerned about high probability events, even if losses were minimal. Hence, flood insurance was not viewed as a necessity, and certainly not a bargain.

> The principle reason for a failure of the market is that most individuals do not use insurance as a means of transferring risk from themselves to others. This behavior is caused by people's refusal to worry about losses whose probability is below some threshold. Consequently they have no interest in protection; people may view it as a poor investment rather than as a meaningful protective mechanism. One reason people do not buy coverage is that they feel they are unlikely to receive anything back on their cash outlays (Kunreuther, et al., 1978:248).

Of course, many people have accepted and purchased some form of hazard insurance. Many qualities have been studied. An Australian research team identified 32 separate variables (Britton, Kearny and Britton, 1983). While important questions remain unanswered, five factors seemed to differentiate. That is, the greater the presence of these factors, the higher the likelihood that insurance could be adopted as a hazard mitigation adjustment:

- Hazard salience;
- Hazard knowledge;
- Hazard awareness;
- Hazard experience; and,
- Favorable company policies.

While perceptual variables are critical, researchers have discovered that actions taken by company personnel play significant roles. This is true for other mitigation efforts too. For example, Palm (1981) investigated the

impact of California's earthquake disclosure legislation, i.e., The Alquist-Priolo Special Studies Zone Act (passed in 1972 and amended in 1975). She documented that many realtors were neutralizing the potential impact. Families purchasing homes in areas known to be seismically active were signing off, as legally required. But, Palm discovered that:

> ... disclosure is not likely to take place at a time when it might jeopardize the sale, that is, when the real estate agent is showing the house to the buyer, but rather at the time the buyer has already decided on the house, at the purchase contract time ... (Palm, 1981:78).

Thus, while there was variation in approach, many home buyers were simply given a form to sign at the time of closing, along with others. Even if they took the time to read the fine print, these forms said nothing about earthquakes. For example, "In Contra Costa County, the form includes a line stating 'Special Studies Zone' and a box marked 'yes' or 'no'" (Palm, 1981:102).

More recently, she and several associates (1983) published survey results obtained from:

> ... 30 California real estate appraisers, 30 mortgage loan officers of other banking executives from the largest lending institutions in the Puget Sound region of Washington, 90 such officers and executives from a sample of lending institutions in the San Francisco and Los Angeles regions as well as statistical analysis of a large data set of characteristics of loan applicants obtained from the California Department of Savings and Loans (Palm, et al., 1983:x).

Study results further documented the uphill battles confronting most hazard mitigation efforts. While there was variability in the ways and degrees that earthquake hazards were incorporated into lending decisions, "an overwhelming proportion" of the smaller lenders in California, and irrespective of size, 'most' of the Washington State lenders, tended to ignore these hazards. Furthermore, these results were "... corroborated by the statistical analysis of loan applications which indicates that location within a Special Studies Zone seems to have little or no impact on the lending decision in most California counties" (Palm, et al., 1983:x).

While acknowledging elements of progress, inspection of the behavioral dimension once again forces emergency managers to look at a social reality. Despite the forward strides brought about by widespread community participation in the NFIP, Burby and French (1981) documented less obvious consequences.

> It often appears that the NFIP induces increased flood plain development because the same factors which lead communities to participate in the NFIP are also associated with continuing flood

> plain and a need for insurance and the potential of new construction in the hazard area because of its attractivesness for development. ... Flood plain land use management regulations, including those required by the NFIP, have had little effect on the rate of flood plain invasion (Burby and French, 1981:294).

It is important, however, to keep a sense of perspective. Public policy pertaining to hazards and issues of risk and safety are relatively new ideas. Thus, it should not be surprising that within the context of very crowded agendas, that local governments adopt decision styles of incrementalism. At least that is what was documented by Wyner and Mann's (1983) case study of 13 local government jurisdictions within California regarding seismic safety policy. Similarly, studies in the states of Missouri and Washington revealed limited interaction among those agencies that might do the most to promote new approaches to earthquake mitigation (Drabek, Mushkatel and Kilijanek, 1983).

Hence, policy formulation processes were at the most embryonic point, in part because agency personnel reflected shared misconceptions. That is, while they as individuals believed that seismic safety was an important issue, they did not believe that such perceptions were shared -- they believed that they alone were concerned about the earthquake threat.

CONCLUSIONS

As this review demonstrates, much has been discovered about the human dimension of emergency management. Obviously, much remains unknown. Given the rate of social change that appears to be a given for the duration of our lifetime at least, the gap between what is known and what emergency management professionals would like to know, will remain pronounced. New policies rapidly alter the research context, thereby constraining the range of generalization even before findings are published. But the partnership has been born -- professional conduct by those accepting the title of "emergency manger" requires that it be given proper priority and structure. Since the complexity of the threats confronting us are increasing daily, so too must our capacity and our commitment.

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